

SECTION 7 - 510(K) SUMMARY OF SAFETY AND EFFECTIVENESS

Submitter Name & Address: Corventis, Inc.
1410 Energy Park Drive, Suite 1
St. Paul, MN 55108

Contact Person: Michele Chin-Purcell, Ph.D.
651-925-3803 (phone)
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Trade/Proprietary Name: AVIVO® Mobile Patient Management System

Common/Usual Name: Mobile Patient Management System

Classification Name: Arrhythmia Detector and Alarm
(21 CFR 870.1025, Product Code DSI)
Patient Physiological Monitor (with arrhythmia detection)
(21 CFR 870.1025, Product Code MHX)

Class: Class II, Special Controls

510(k): Abbreviated 510(k)

Date Prepared: October 28, 2011

Predicate Devices:

1. AVIVO Mobile Patient Management System, Corventis, Inc. cleared by FDA under 510(k) numbers K083287, K090696, and K091971; 21 CFR 870.1025, DSI "Arrhythmia Detector and Alarm", and 21 CFR 870.1025, MHX "Patient Physiological Monitor (with arrhythmia detection)"
2. NUVANT® Mobile Cardiac Telemetry System, Corventis, Inc. cleared by FDA under 510(k) number K090696, K091971, and K111917; 21 CFR 870.1025, DSI "Arrhythmia Detector and Alarm", and 21 CFR 870.1025, MHX "Patient Physiological Monitor (with arrhythmia detection)"
3. ZOE Fluid Status Monitor, Noninvasive Medical Technologies, LLC, cleared by FDA under K042113; 21 CFR 870.2770, DSB "Impedance Plethysmograph"

BACKGROUND INFORMATION

The following is the subject device of this Abbreviated 510(k):

- The AVIVO Mobile Patient Management System (hereafter referred to as “subject AVIVO”)

This submission proposes to add clarifying language (e.g., listing the type of non-lethal arrhythmias) to the predicate AVIVO indications for use. This clarifying language is similar to that used in the predicate NUVANT device. Additional language is being proposed (e.g.: when fluid status measurements may be useful) to align with the predicate ZOE indications for use. These changes are for clarification and do not change to the intended therapeutic, diagnostic, prosthetic, or surgical use of the device, and do not affect the safety and effectiveness of the device when used as labeled [807.92(a)(5)].

The intent of the subject devices remains the same as that of the predicate devices, which is to monitor ECG, heart rate and other physiological parameters such as body fluid status.

INDICATION FOR USE STATEMENT

The following are the proposed indications for use in this submission:

The AVIVO Mobile Patient Management System is intended to continuously record, store, and periodically transmit physiological data. The System is indicated for patients:

- *with fluid management problems*
- *taking diuretic medication*
- *living with heart failure*
- *living with end-stage renal disease*
- *suffering from recurrent dehydration*
- *who require monitoring for the detection of non-lethal cardiac arrhythmias such as, but not limited to, supraventricular tachycardias (e.g. atrial fibrillation, atrial*

flutter, paroxysmal SVTs), ventricular ectopy, bradyarrhythmias and conduction disorders.

The AVIVO Mobile Patient Management System also monitors, derives and displays:

- *ECG*
- *Heart Rate (including HR variability)*
- *Activity*
- *Posture*
- *Respiration rate (including RR variability)*
- *Body fluid status*

TECHNOLOGICAL CHARACTERISTICS AND SUBSTANTIAL EQUIVALENCE

The AVIVO System is wearable, wireless arrhythmia detection system that is used by clinicians to identify suspected cardiac arrhythmias and monitor physiologic signals. In combination with interpretation services provided by learned intermediaries in the Corventis Monitoring Center as well as online review of data (for prescribing physicians only), AVIVO enables arrhythmia detection and other physiological data monitoring for up to 7 days for each PiiX application.

The AVIVO system components are:

- PiiX® (aka: Adherent Device) - a patient-worn device which is applied to the patient's torso. It contains the ECG electrodes for recording ECG, heart rate and other physiological data.
- zLink® (aka: Gateway) – hand-held device that receives information from the PiiX and transmits it to the Corventis Server via cellular technology.
- Server - The Server receives sensor data from the PiiX via zLink. ECG, heart rate and other physiological parameters are presented to learned intermediaries, Corventis cardiographic technicians, who prepare and deliver the information to prescribing physicians

The communication between the PiiX and the zLink is enabled via Bluetooth Technology. Sensor data and ECGs collected by the PiiX are transmitted to the Server via zLink.

The AVIVO and NUVANT system components are identical except for the use of a Patient Trigger Magnet, which is available for the patient to manually trigger the ECG

collection when he/she experiences symptoms when using the NUVANT system. The system components of the subject AVIVO are identical to the system components of the predicate AVIVO and predicate NUVANT.

PREDICATE DEVICES

Three (3) predicate devices have been identified:

1. AVIVO Mobile Patient Management System, Corventis, Inc. cleared by FDA under 510(k) numbers K083287, K090696, and K091971; 21 CFR 870.1025, DSI "Arrhythmia Detector and Alarm", and 21 CFR 870.1025, MHX "Patient Physiological Monitor (with arrhythmia detection)"
2. NUVANT® Mobile Cardiac Telemetry System, Corventis, Inc. cleared by FDA under 510(k) number K090696, K091971, and K111917; 21 CFR 870.1025, DSI "Arrhythmia Detector and Alarm", and 21 CFR 870.1025, MHX "Patient Physiological Monitor (with arrhythmia detection)"
3. ZOE Fluid Status Monitor, Noninvasive Medical Technologies, LLC, cleared by FDA under K042113; 21 CFR 870.2770, DSB "Impedance Plethysmograph"

The following table summarizes the compared features and the corresponding predicate devices.

Features comparison and corresponding predicate devices

Features being compared	Predicate Devices
All technical features	Predicate AVIVO (K083287, K090696, K091971) Predicate NUVANT (K090696, K091971, K111917)
Body Fluid Status	Predicate Zoe (K042113)
Indications for Use	Predicate NUVANT (K111917) Predicate ZOE (K042113)

SUMMARY OF PERFORMANCE TESTING

The subject and predicate AVIVO and predicate NUVANT meet the requirements of following performance standards in accordance with *FDA Class II Special Controls Guidance Document: Arrhythmia Detector and Alarm*.

IEC 60601-1

Medical Electrical Equipment – Part 1: General Requirements for Safety, 1988;
Amendment 1, 1991-11, Amendment 2, 1995

IEC 60601-1-2

Medical Electrical Equipment - Part 1-2: General Requirements for Safety -
Collateral standard: Electromagnetic Compatibility - Requirements and Tests
(Edition 2:2001 with Amendment 1:2004; Edition 2.1 (Edition 2:2001
consolidated with Amendment 1:2004))

AAMI/ANSI EC38

Medical electrical equipment - Part 2-47: Particular requirements for the safety,
including essential performance, of ambulatory electrocardiographic systems,
2007.

AAMI/ANSI EC57

Testing and reporting performance results of cardiac rhythm and ST-segment
measurement algorithms, 1998/(R) 2008

CONCLUSION

The modifications proposed in the subject AVIVO System make clarifications to the indications for use and do not change the fundamental scientific technology or use of the devices. As supported by the descriptive information and the bench tests, it is concluded that the AVIVO Systems are as safe and as effective as the predicate devices.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Room - WO66-G609
Silver Spring, MD 20993-0002

JAN - 4 2012

Corventis, Inc.
c/o Kathleen Lundberg
VP of Quality, Regulatory, and Clinical Affairs
1410 Energy Park Drive, Suite #1
St. Paul, MN 55108

Re: K113187
Trade/Device Name: AVIVO Mobile Patient Management System
Regulation Number: 21 CFR 870.1025
Regulation Name: Arrhythmia detector and alarm (including ST-segment measurement and alarm)
Regulatory Class: Class II (two)
Product Code: MHX, DSB, DSI
Dated: October 28, 2011
Received: October 31, 2011

Dear Ms. Lundberg:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

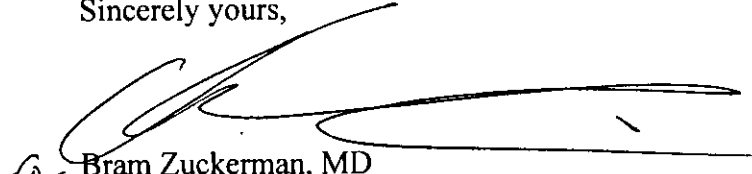
If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please go to <http://www.fda.gov/AboutFDA/CentersOffices/CDRH/CDRHOffices/ucm115809.htm> for the Center for Devices and Radiological Health's (CDRH's) Office of Compliance. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,



Bram Zuckerman, MD
Director
Division of Cardiovascular Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): ~~N/A~~ K113187

Device Name: AVIVO® Mobile Patient Management

Indications for Use:

The AVIVO Mobile Patient Management System is intended to continuously record, store, and periodically transmit physiological data. The System is indicated for patients:

- with fluid management problems
- taking diuretic medication
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- suffering from recurrent dehydration
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- ECG
- Heart Rate (including HR variability)
- Activity
- Posture
- Respiration rate (including RR variability)
- Body fluid status

Prescription Use X
(Part 21 CFR 801 Subpart D)

AND/OR

Over-The-Counter Use _____
(21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE OF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

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(Division Sign-Off)

Division of Cardiovascular Devices

510(k) Number K113187